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Film 40 is unwound from unwind roll 16 and proceeds in the direction of arrows 41. Unwind roll 16 may be part of an unwind station (not shown) which permits new rolls to be substituted for spent rolls without manually attaching the two webs together. Film 40 proceeds over tracking mechanism 18, which aligns the film, and then over applicator roll 12, where a bead of adhesive 46 passes through valve 32 and tip 36 and is laid down on the surface of film 40, which is supported by applicator roll 12. The adhesive is forced through valve 32 and tip 36 by the pressure exerted on it in a pressure tank (not shown) containing nitrogen or clean air, which tank is connected to inlet line 34 and to a remote pressure source through appropriate valving. Typically tip 36 is spaced 0.005 inches from film 40, but this distance may vary from about 0.001 inch to about 0.010 inch, depending upon the specific adhesive used, the width of the adhesive band desired to be laid down to make a particular seam, and the configuration and inner diameter of the tip. It is believed that this range could extend from 0 inch to about 0.010 inch. Film 40 then proceeds to conventional folding mechanism 20, where it is folded into a tube with its opposite longitudinal edge portions overlapping. Next, film 40 passes between nip rolls 14, where the two edge portions are squeezed together to create the seam. Finally, film 40 passes over tension control idler 24 and onto rewind roll 26. Rewind roll 26 may be part of a rewind station (not shown) which permits empty rolls to be substituted for full rolls, without manual attachment of a cut film edge to an empty roll core.

FIG. 8 shows edge portion 42 of flat web of film 40 just after bead of adhesive 46 has been applied to it.

FIG. 9 shows edge portion 42 later, just after film 40 has been folded into a tube with edge portions 42, 44 overlapped, as bead of adhesive 46 is about to contact edge portion 42. The time interval between FIGS. 4 and 5 may vary from about 0.3 seconds to about 4.0 seconds. It is believed that this interval could be as brief as 0.2 seconds. A typical distance between applicator roll 12 and nip rolls 14, as measured along the film, is 4.5 feet. During this interval the solvent in adhesive bead 46 has dissolved some of the film, creating channel 48 in edge portion 42. Channel 48 helps confine bead 46 and limit its lateral movement.

FIG. 10 shows film edge portions 42, 44 and adhesive (mixed with dissolved film) 46 just after they have passed between the nip rolls. Adhesive 46 now has a rounded hat-shape cross-sectional profile, with crown 50 and brim 52. Crown 50 occupies channel 48, and brim 52 lies along the interface between edge portions 42 and 44. Chain line 54 indicates the original position of the surface of edge portion 42.

The rapid transition between FIGS. 9 and 10, which occurs just prior to the nip rolls and in the nip of the nip rolls, is important. As film edge portions 42, 44 are being progressively squeezed by the nip rolls, adhesive 46 is progressively exuded laterally into the interface in the direction of arrows 56. We believe that channel 48 is a critical factor in creating a strong seam of precisely and neatly placed adhesive, but we cannot describe with certainty the physical principles involved. There are several possibilities. One possibility is that the channel confines the adhesive bead so that it is not displaced laterally during the movement of the film as it is being handled between the applicator roll and the nip roll. Another possibility is that the channel increases the stability of the bead during its compression by the nip rolls, by reducing its effective height. Another possibility is that the channel increases the stability of the bead during such compression because of the increased surface contact pro-

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vided by the channel. Another possibility is that during compression the body of adhesive material in the channel acts as a "reservoir" of adhesive which, when exuded from the channel, is "metered out" laterally into the interface more gradually than it would have been in the absence of a channel. Another possibility which takes into account flow of the adhesive ahead of the nip rolls in the longitudinal direction (i.e., toward a viewer of FIG. 10 and toward rewind roll 26 in FIG. 6) is that the channel acts as a guide for such forwardly flowing adhesive which has been partially, but not completely, squeezed by the nip rolls. We believe that one or some combination of these possibilities probably occurs, but we do not represent that all of them occur, and we do not wish to be bound by particular theories underlying our invention.

In the final seam, crown 50 of the hat-shape is believed to serve as a mechanical anchor in film edge portion 42. Typical dimensions of the crown and brim are 0.5 mm and 2.5 mm, respectively. The width of the brim should be at least 0.3 mm. Normally it would be less than 3.0 mm.

FIG. 11 shows an embodiment having two adhesive joints, a hat-shaped joint 60 of larger cross-sectional profile and a hat-shaped joint 62 of smaller cross-sectional profile. Joint 60 provides the strength of the single joint described above, while joint 62 keeps the portion of the film nearest the edge from lifting up or snagging after the sleeve has been heat-shrunk onto a container.

The system for controlling the pressure in the adhesive delivery line is shown in FIG. 12. The computer receives a speed signal from the seamer drive controller that is proportional to the film speed, then calculates a pressure value that is also proportional to film speed. It sends this signal to a closed loop PID controller to be used as a pressure setpoint for the system. The PID controller then uses this setpoint to control the output pressure at the applicator by means of sending a pressure signal to an I/P control valve and monitoring the output pressure at the applicator by a pressure signal sent back by a P/I transmitter mounted near the applicator. The PID controller maintains a pressure proportional to film speed by continuously monitoring the setpoint and feedback signals.

FIG. 13 is a graph in which solid line 70 shows the relationship between film line speed and fluid pressure in the adhesive delivery line for a producing sleeves for a particular dispensing tip, a particular adhesive, and a particular film. To widen the bead of adhesive being laid down, the computer is adjusted so that the entire curve is moved up to the location shown by broken line 72. To narrow the bead, the computer is adjusted so that the entire curve is moved down to the location shown by chain line 74.

It will be understood that, while presently preferred embodiments of the invention have been illustrated and described, the invention is not limited thereto, but may be otherwise variously embodied within the scope of the following claims. It will also be understood that the method claims are not intended to be limited to the particular sequence in which the method steps are listed therein, unless specifically stated therein or required by description set forth in the steps.

What is claimed is:

1. A method of forming a seam at overlapped first and second longitudinal edge portions of plastic film comprising the steps of
 - providing an applicator roll, a dispensing valve with a dispensing tip spaced closely to the circumferential